

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of

Application of RBC Signals LLC for a)
180-Day Special Temporary Authorization) Call Sign:
To Operate an Earth Station To Provide)
Receive-Only Telemetry Support To) File No.: SES-STA-_____
Foreign-Licensed Satellites)

Expedited Consideration Requested

REQUEST FOR SPECIAL TEMPORARY AUTHORITY

RBC Signals LLC (“RBC Signals”), pursuant to Section 25.120 of the Commission’s rules,¹ respectfully seeks a 180-day special temporary authorization (“STA”) to operate currently authorized yagi antennas (the “400 MHz Yagis”) at its existing earth station site in Fairbanks, Alaska, to provide receive-only telemetry support for certain foreign-licensed, non-geostationary satellite orbit (“NGSO”) cubesats operated by Spacety Co., Ltd. (“Spacety”).² RBC Signals seeks to perform receive-only telemetry operations in the 401.5-401.9 MHz band (space-to-Earth), specifically with downlink carriers centered at 401.60625 MHz, 401.69375 MHz, 401.79250 MHz and 401.80000 MHz.

Grant of this 180-day STA will allow RBC Signals to provide receive-only telemetry services for the Spacety spacecraft, enhancing spacecraft control and operations and thus

¹ 47 C.F.R. § 25.120.

² The Spacety spacecraft include a total of six 6U cubesats. Three satellites will be launched on October 28, 2018 (the TY1-02, TY1-03 and TY4-02 satellites) (“First Tranche Spacety Satellites”), and three satellites will be launched on December 7, 2018 (the TY1-05, TY3-01 and TY3-02 satellites) (“Second Tranche Spacety Satellites”).

furthering the public interest.³ Because the First Tranche Spacety Satellites will be launched on October 28, 2018, before the Commission could possibly grant this 180-day STA request, RBC Signals has concurrently filed a request for 30-day STA to provide telemetry support for these Spacety spacecraft.⁴

I. BACKGROUND

RBC Signals seeks to support the Spacety spacecraft using currently installed 400 MHz Yagis (the M2 Antenna Systems Model 400CP30A) at its existing earth station in Fairbanks, Alaska.⁵ RBC Signals currently operates at this site in the 401-402 MHz band with no reported cases of interference, and this request will not increase the potential for interference because the limited, receive-only operations are similar to currently authorized operations.

The Spacety spacecraft are operated by Spacety, a Chinese company developing and deploying a series of 6U cubesats to conduct initial technology demonstrations. Spacety seeks to provide short-cycle, low-cost cubesats and related services to scientists, research institutes, and commercial companies to support science experiments and technology trials. Towards this end,

³ The mission life of the Spacety spacecraft, approximately one year from launch, does not warrant long-term commercial earth station license authority for the proposed operations. Consistent with past practice regarding STA authority for time-limited earth station operations, RBC Signals intends to request a single renewal of the proposed 180-day STA to ensure appropriate Commission authority for the life of the mission.

⁴ In the event that the 180-day STA is not granted in time for the December 7th launch, RBC Signals will file an additional 30-day STA request to cover the launch and initial mission period for the Second Tranche Spacety Satellites. In such an event, RBC Signals understands that the pendency of the 180-day STA request will facilitate continue communications with the First Tranche Spacety Satellites (*see* 47 C.F.R. §§ 25.120 & 25.163(b); Administrative Procedure Act § 9(b). *See also* 47 C.F.R. §1.955(b); *In the Matter of Marc D. Sobel Application for Consent to Assign the License for Conventional 800 MHz SMR Station KKT934, Montrose, California*, Memorandum Opinion & Order, FCC 05-90, ¶¶ 2 & 6).

⁵ *See* RBC Signals, LLC, File No. SES-STA-20180719-01879 (180-day STA extension to provide TT&C support for the Radix mission in the 401-402 MHz band).

the Spacety spacecraft will allow Spacety to test components, software design, and operational concepts of its laser projection, remote sensing, and X-ray detection capabilities.

The following table provides an overview of the Spacety spacecraft satellites, missions, and launch dates. RBC Signals understands that authority for TT&C operations does not constitute market access to the United States for those satellites and therefore is not providing the full technical information contemplated by Sections 25.114 and 25.137 of the Commission’s rules for U.S. market access requests.⁶

Table 1. Spacety Spacecraft Overview

Satellite	Mission	Launch	ITU Filing
TY1-02	Laser Projection Communications Testing	Oct. 28, 2018	TY2D
TY1-03	Optical Remote Sensing Payload Testing – 15m	Oct. 28, 2018	TY2D
TY1-05	Optical Remote Sensing Payload Testing – 5m	Dec. 7, 2018	TFStar
TY3-01	Optical Remote Sensing Payload Testing – 15m	Dec. 7, 2018	TY2D
TY3-02	Optical Remote Sensing Payload Testing – 15m	Dec. 7, 2018	TY2D
TY4-02	X-Ray Polarization Detection Testing	Oct. 28, 2018	TY2D

Nonetheless, RBC Signals notes that the Spacety spacecraft are being licensed and registered as space objects with the United Nations by China, a WTO-member country. To the extent relevant, there is a presumption in favor of entry for these satellites.⁷ The Spacety spacecraft command (uplink) operations will be conducted from China in the VHF 149.7875 - 149.8125 MHz band spectrum.

⁶ See 47 C.F.R. §§ 25.114 and 25.137. See also SES Americom, Inc., File No. SES-MFS-20160624-00607, Call Sign E050287 (granting authority for an earth station to provide TT&C services to the foreign-licensed ASTRA 3A operating at 86.85° W.L.); Hawaii Pacific Teleport, L.P., File No. SES-MFS-20131030-00913, Call Sign E030115 (granting authority for an earth station to provide TT&C services to ASTRA 3A operating at 176.85° W.L.); SES Americom, Inc., File No. SES-STA-20161110-00884, Call Sign E050287 (granting authority for an earth station to provide TT&C services to ASTRA 3A during drift from 86.85° W.L. to 47.0° W.L.); Hawaii Pacific Teleport, L.P., File No. SES-STA-20131030-00914, Call Sign E030115 (granting authority for an earth station to provide TT&C services to ASTRA 3A operating at 176.85° W.L).

⁷ See 47 C.F.R. § 25.137(a)(2).

RBC Signals seeks to provide reliable telemetry support for the Spacety mission from the United States, which is important to maintain effective communications with the satellites during orbit. Spacety has realized the critical importance of receiving telemetry data for mission optimization and other program-related issues given the satellites lack onboard propulsion. RBC Signals can provide immediate telemetry support using its existing earth station operating in the 401-402 MHz band at the Fairbanks, Alaska facilities given the receive-only nature of this request.

RBC Signals' telemetry operations will be conducted on an unprotected and non-interference basis intermittently and as-needed for telemetry downlink between one and six times per day while the satellites pass over the earth station. RBC Signals provides the attached Technical Appendix, including a draft FCC Form 312 Schedule B, for information relating to the proposed earth station operations and the Spacety spacecraft.⁸ In addition, RBC Signals will conduct these operations in accordance with the Commission's rules and interagency requirements governing fixed earth station operations in the subject band. As discussed below, grant of the requested STA will serve the public interest, convenience, and necessity.

II. DISCUSSION

RBC Signals seeks to operate the 400 MHz Yagis with the Spacety cubesats in the 401.5-401.9 MHz band (space-to-Earth) to receive telemetry data from the satellites. The data will be used to validate the mission and quality of data collected. Grant of this STA request is critical for the reliability of the Spacety mission and will not increase the potential for interference because they are receive-only operations.

⁸ The Technical Appendix includes an overview of the VHF-band, UHF-band and X-band service links of all of the Spacety spacecraft. To the extent the Commission requires any additional information in connection with this STA request, RBC Signals respectfully reserves the right to supplement the information provided herein.

The Spacety spacecraft satellites conform to the form factor of a 6U cubesat (350mm x 259mm x 132mm in the stowed configuration and 801mm x 430mm x 425mm in the deployed configuration), with a total mass of approximately 10 kg. The First Tranche Spacety Satellites will be launched as secondary payloads aboard a Long March CZ-2C launch vehicle from the JinQuan launch center in China on October 2018. The satellites will be launched into a nominal circular, sun-synchronous orbit at 528 km apogee and 528 km perigee with an inclination from the equator of 97.5°. An orbital lifetime calculation for this orbit estimates that the satellite will remain in orbit for approximately 5.5 years (under worst case conditions), well within the limits set by internationally accepted guidelines.⁹

The Second Tranche Spacety Satellites will be launched as secondary payloads aboard a Long March CZ-2D launch vehicle from the JinQuan launch center in China on December 7, 2018. The satellites will be launched into a nominal circular, sun-synchronous orbit at 536 km apogee and 536 km perigee in with an inclination from the equator of 97.6°. An orbital lifetime calculation for this orbit estimates that the satellite will remain in orbit for approximately 5.9 years (under worst case conditions), also well within the limits set by internationally accepted guidelines.¹⁰

A. Telemetry Spectrum Use

The United States Table of Frequency Allocations (“Table of Allocations”), Section 2.106 of the Commission’s rules, 47 C.F.R. § 2.106, provides that the 401-402 MHz band is shared on a co-primary basis between meteorological aids (Earth-to-space) and space operations services (space-

⁹ See Orbital Debris Assessment Report (attached).

¹⁰ See *id.*

to-Earth). RBC Signals seeks to perform telemetry downlink operations in specific frequencies from 401.5-401.9 MHz consistent with the co-primary space operations allocation in this band.¹¹

RBC Signals acknowledges that there are certain U.S. government meteorological aids and earth exploration operations conducted in the 401-402 MHz band.¹² Moreover, RBC Signals understands that although expanded Federal use of the 401-402 MHz band is anticipated, such plans do not commence until well after the end of the Spacety mission. RBC Signals will continue to work with Commission staff to ensure that these temporary receive-only operations will not increase the potential interference to current or future government users, and will coordinate with NASA, NOAA, and other U.S. government agencies to ensure that the limited telemetry operations proposed herein are compatible with government operations and that the interests of the United States are fully accommodated.

The earth station site in Fairbanks, Alaska currently supports TT&C operations (transmit and receive) in the 401-402 MHz band with no reported cases of interference, and RBC Signals' receive-only telemetry operations in this band will not present an interference risk to other authorized users. In addition, previous operations at these locations suggest that expedited processing and grant of this request would not adversely affect other users of the spectrum.

B. STA Request & Public Interest Considerations

RBC Signals respectfully seeks this 180-day STA pursuant to Section 25.120 of the Commission's rules, 47 C.F.R. § 25.120. A 180-day STA is appropriate because RBC Signals does not plan to file an application for regular authority for the subject receive-only telemetry operations

¹¹ See 47 C.F.R. § 2.1 (defining "space operations" as "a radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry, and space telecommand.").

¹² See https://www.ntia.doc.gov/files/ntia/publications/compendium/0401.00-0402.00_01MAR14.pdf.

because the length of the mission (approximately one year) does not warrant a long-term commercial earth station license (i.e., a 15-year term).

Extraordinary circumstances exist to grant this request (i.e., the critical need for western hemisphere telemetry earth stations to support launch and operation of the satellites), and RBC Signals requests that the Commission grant this STA request with the proposed commencement date at the earliest practicable time. In particular, Spacety has realized the critical importance of receiving telemetry data for mission optimization and other program-related issues given the satellites lack onboard propulsion. Given the unique circumstances here, including the existing operations in the 401-402 MHz band at the Fairbanks, Alaska site, temporary authority for telemetry from this site for the Spacety satellites is warranted.

Grant of this STA request is in the public interest because it will facilitate the safe operation of the Spacety spacecraft satellites by ensuring reliable telemetry functions in time for the launch of the satellite and providing insight into the commercial viability of Spacety's technology and services via true global ground station support. Grant of this STA request will also promote U.S. leadership in the development of next-generation satellite services by enabling a U.S. company to provide critical NSGO ground station services in the United States and worldwide.

III. CONCLUSION

In view of the foregoing, including the receive-only nature of the proposed operations and the critical nature of telemetry data to support the mission after launch, the public interest would be served by a grant of this 180-day STA request to allow RBC Signals to perform telemetry functions for the Spacety spacecraft using the 400 MHz Yagis from its existing earth station facilities in Fairbanks, Alaska.